Welcome to Valspar's course on Painted versus Anodized Coatings. We’re glad you’ve joined us today.
CEU Credit Course Learning Objectives

1. Identify the advantages and limitations of anodized and paint coatings for aluminum extrusion building products.
2. Describe extrusion, anodized and coating manufacturing processes.
3. Provide overview of coating chemistry.
4. Understand color options and finish hardness for each solution.
5. Learn the difference between field performance of anodized versus paint coatings, and life cycle and warranty considerations.

Today we are talking about the difference between coating and anodizing a metal substrate for aluminum extrusion building products.

In the first part of the presentation, I’ll talk about the advantages and limitations of coatings and anodizing. Next we’ll talk about the manufacturing processes for extrusion, anodizing and coatings.

Then, we’ll dive a little deeper into coating chemistry. From there, we’ll talk about color options and finish hardness for coatings and anodized parts.

We’ll wrap up with a brief discussion on field performance, life cycle and warranty considerations. Considerations that are very important to you as architects.
Let’s get started by identifying the advantages and limitations of anodized and paint coatings for aluminum extrusion building products.
There are a lot of different building products made from extruded metal...from curtain walls to windows to entry canopies.
The reason extruded aluminum products are popular is because they offer a number of benefits.
Benefits of Aluminum Extrusion Products

- Wide range of finishing options
- Complex, intricate shapes are possible
- Lightweight
- Strong
- Non-toxic
- 100% recyclable

What are some of the benefits of using aluminum extrusion products? First, there’s a wide range of finish options available.

From a manufacturing perspective, many shapes can be made during the extrusion process, making it a very versatile metal to work with.

Aluminum is both lightweight and strong. It makes an excellent building material.

From an environmental standpoint, aluminum is a non-toxic metal, and it’s 100% recyclable. A soffit today could be a door frame tomorrow.
Why Extrusion Products Need a Finish

- Add color and beauty
- Protect the substrate
- Hide metal defects

There are three main reasons why extrusion products need a finish:

First, a finish adds color and beauty. This can provide a distinctive look to a building or home.

Second, a very important reason to use a finish is for protection of the substrate. As we all know, when you put metal in the environment, it’s going to corrode. And we want to protect it against corrosion.

And, depending on the type of aluminum part, it can be very important to hide the metal defects on the finished product. For example, if the part is being used on a column in front of a building, you would not want to see imperfections on the metal substrate. A coating can help hide those defects when the product is used in a highly visible space.
There are two main types of coatings for extruded aluminum.

High-performance coatings are more typically used on high-end monumental, commercial and industrial buildings. They’re also used on high-end residential products. And, these coatings are popular for high-traffic areas like storefronts, handrails, entry systems and windows.

In contrast, anodized finishes are more typically found on storefronts and institutional buildings such as schools and government buildings.

Aluminum Extrusion Options for Finish

- High-performance coatings
  - Monumental, commercial and industrial buildings
  - High-end residential
  - High-traffic areas: storefronts, handrails, entry systems and windows
- Anodized finishes
  - Mid-range storefronts
  - Institutional buildings: schools and government buildings
## Introduction to Coating and Anodizing

<table>
<thead>
<tr>
<th>COATING</th>
<th>ANODIZING</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Spray-apply high-performance liquid coating on aluminum substrate</td>
<td>- Electrochemical oxidation of aluminum substrate</td>
</tr>
<tr>
<td>- Bake to form durable protective layer</td>
<td>- Color can be used to enhance metal</td>
</tr>
</tbody>
</table>

What exactly is the coating process all about and how does it compare to anodizing an aluminum substrate? There are some differences.

In simple terms, the coating process involves spray-applying a high-performance liquid coating on the aluminum substrate. Then, the coated part is baked in a high-temperature oven, which helps the coating form a durable protective layer.

In contrast, the anodizing process is a way to speed up the oxidation of an aluminum substrate through an electrochemical process. You don’t have to apply color, but you can if you want to enhance the metal.
Strengths of High-Performance Coatings

- **Aesthetics**
  - Thousands of color options
  - Effects: pearlescent, mica, metallic, color-shifting
  - Small batch and custom-color capabilities
  - Wide gloss range
  - Mar resistant
  - Field touch-up/repair capabilities

- **Performance**
  - Meets or exceeds AAMA 2605
  - Corrosion protection
  - UV resistance and color retention

Let’s discuss some of the strengths that you can achieve when using high-performance coatings. First, the aesthetics. There are a number of benefits. For example, you can choose from thousands of colors. Beyond colors, there are many special effects that can be achieved as well...such as pearlescent finishes, mica or metallic finishes – even interesting color-shifting effects. There is also the option of creating very small batches of custom colors to add a signature effect on the building. Overall, high-performance coatings give you the opportunity to provide a unique look on your design projects.

Another great benefit to using a high-performance coating is the wide range of glosses available – from high-tech matte to ultra-gloss finishes. Coatings also provide great mar resistance and can easily be touched up in the field.

From a performance standpoint, extrusion coatings can meet and even exceed AAMA 2605 standard – which, as you know, is the highest standard in the architectural industry. These coatings provide outstanding corrosion protection. And, they protect against ultraviolet radiation, retaining their color over time.
There are a few limitations when using high-performance coatings. Even though the coating is hard and mar resistant, the good news is that these coatings are easy to touch-up.

When using high-performance, solvent-based coatings, they do emit VOCs. However, when the coating is applied, VOCs can be captured and reused during the curing process to heat the ovens.

And finally, there is also the potential for metallic paints to have an inconsistent appearance if the spray application process is not managed properly.
Strengths of Anodized Finishes

- **Performance**
  - Extreme hardness
  - Corrosion protection
  - Abrasion resistance

- **Process**
  - No VOCs in anodizing process
  - Anodized metal is recyclable

Now let’s compare anodized finishes. From a performance standpoint, they’re extremely hard. In fact, the finish is actually harder than the second hardest substance on Earth, which is sapphire.

Anodizing also delivers strong corrosion protection and abrasion resistance.

From a process standpoint, there are no VOCs created in the anodizing process. It is just an electrochemical process, so there is no coating or baking.

And, anodized metal is recyclable, which is an added benefit.
Limitations of Anodized Finishes

- Minimal color choices
- Hard to hide aluminum surface defects
- Color can vary depending on aluminum
- Inability to touch-up scratches or marks
- Chemically-intensive anodizing process
- Limited corrosion resistance in coastal settings

There are some limitations with anodized products. First, the color choices are extremely limited. Second, it’s hard to hide the surface defects in aluminum extruded products. The anodized surface is transparent. Color matching can be extremely challenging. The color can vary from batch to batch depending on the aluminum alloys used and even the trace elements found in the metal.

Even though anodized parts are extremely hard, they can be scratched. When this happens, there is no recourse in the field for a repair. The fix is to replace the entire part.

From an application standpoint, the anodizing process is chemically intensive with the use of acids and bases. Another important consideration is that anodized products have limited corrosion resistance when exposed to the humidity and salt spray found in coastal settings. If you’ve ever stayed at a beach location, you may have noticed this type of corrosion damage on extruded aluminum.

You can understand why it’s important to know both the strengths and the limitations of each finish option for extruded parts in the design phase of your project.
In this table, you will see a quick comparison of color and coating qualities between the two finishes.

- From a gloss standpoint, coatings provide a wide range of glosses – but with an anodized finish you are limited.
- When we look at color, there are thousands of color options with high-performance coatings, but with anodizing, you have very limited options.
- For weatherability, both finishes perform well with one exception. You would not want to choose an anodized part in a harsh coastal setting.
- Coatings can be easily repaired and refreshed in the field. This makes them a great choice in high traffic areas. However, with an anodized part, you’d have to replace the entire part as field repairs are not possible. Of course, that is expensive.
- Finally, both finishes meet AAMA specifications, which we’ll spend more time on later in this presentation.

<table>
<thead>
<tr>
<th>Qualities</th>
<th>High-Performance Coating</th>
<th>Anodized Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloss</td>
<td>Wide range available</td>
<td>Limited gloss range</td>
</tr>
<tr>
<td>Color Options</td>
<td>Almost unlimited</td>
<td>Very limited</td>
</tr>
<tr>
<td>Weatherability</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Touch-up Repairs in Field</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>AAMA Specifications</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
COMPLETED:
Learning Objective One

Identify the advantages and limitations of anodized and paint coatings for aluminum extrusion building products.

With that, we have completed learning objective number one – covering both the advantages and limitations of anodized and paint coatings for aluminum extrusion building products.
Next, we’ll learn a bit more about the manufacturing processes when making extruded parts.

Learning Objective Two

Describe extrusion, anodized and coating manufacturing processes.
First, let’s talk about the extrusion manufacturing process itself, which is used to form aluminum into precise shapes.

Extrusion presses exert high pressure on parts to force aluminum through the shaped opening of a steel die. This creates an extruded aluminum profile. As you’ll see in the photos – you can extrude aluminum into a wide variety of shapes.

Extrusion Manufacturing Process

- Forming aluminum into shapes of exact specifications
  - Extrusion presses use high pressure and heat
  - Aluminum can be extruded into wide variety of shapes
Here’s a simplified drawing of the manufacturing process for extruded products:

- First, a billet of aluminum is heated in a furnace that can be as hot as 930 degrees Fahrenheit.
- Next, the hot billet enters the extrusion press, where it is forced into a mold to shape it. Then, 1,600 to 6,500 tons of pressure is used to create the shape.
- A saw is used next to cut the part to proper length.
- Next, a stretcher is used to straighten the long lengths. This process also slightly strengthens the mechanical properties of the part.
- Last, the parts are placed in an aging oven. Extrusions are heated at about 375 degrees Fahrenheit. They stay in the oven four to eight hours. This further develops the mechanical properties of the extrusions, particularly their strength.

This is a quick overview of how an extruded part is made.
Now, let’s spend some time on the anodizing process, which is highly automated.

At the highest level, there are three major steps.

- First, you must clean the part.
- Next, a chemical reaction occurs to oxidize the aluminum.
- Finally, you seal the metal.
Anodizing Process

Clean: Dirt, water, soluble oils and contaminates are removed
Rinse: Aluminum is rinsed
Etch: Thin layer is dissolved on aluminum surface
De-smut: Surface oxides and smut are removed
Anodize: Oxygen is combined with aluminum
Color: Electro-deposition is used
Seal: Hydrothermal process and hot rinse are used

Let’s take a closer look into the chemically-intensive anodizing process.
- The first step is to CLEAN the part, removing dirt, water, soluble oils and surface oxides with a cleaner such as sodium hydroxide.
- In the RINSE step, aluminum is prepared for the etching process.
- In ETCHING, a thin layer of aluminum is dissolved by a caustic or an acid to reduce imperfections in the metal.
- During the DE-SMUT stage, the pretreatment layer is removed with a nitric acid solution to further prepare the metal for anodizing.
- During ANODIZING, oxygen is combined with the aluminum and undergoes an electrolytic process to form the coating layer.
- During the COLOR phase, neutral colors are achieved through electro-deposition of inorganic metal deposits into the aluminum. The longer the part stays in the solution, the darker it becomes. For brighter colors, organic dyes are used, which do not last as long as color from electro-deposition of metal.
- In the last step, the metal substrate is SEALED with a nickel acetate solution and combined with a hot rinse to ensure the finish will maintain its durability and aesthetics.
Now, let's take a look at the coating process.

At a high-level, there are three steps.
- First, you clean the metal just like anodizing.
- Then, you apply the coating. A coating can consist of a primer and topcoat.
- In the final step, you cure the coating.
Coating Process

Looking step-by-step at the coating process,

- First, you **CLEAN** the metal. This involves removing all of the contaminants from the metal, like dirt and oils. The metal is then pre-treated to create a uniform surface and to maximize the adhesion of the coating to the metal. This is a critical step.
- In the next step, the coating is **APPLIED**. In this case, you’ll typically see a primer spray-applied to the metal substrate followed by the top coat application. Then, a clear coat is sprayed over the top coat for added strength and durability.
- In the final **CURE** step, heat is used to thermally set the coating system.

**Clean**
Contaminates are removed and metal is pretreated to create uniform surface

**Apply**
Metal is spray-coated with primer, top coat and clear coat

**Cure**
Heat is used to thermally cure and set the coating system
This is a diagram of a typical horizontal manufacturing coating line. All of the parts are horizontally arranged.

These lines usually produce smaller product batches because they provide a lot of flexibility in how they are set up. This set-up makes it easy to change out parts.

The parts go through a series of spray booths to apply the coatings. All parts get a primer and top coat. Some parts would also get a clear coat for added protection.

Once a part is coated, it goes through the bake oven to cure the coating.
A vertical manufacturing line, in contrast, is more automated and is designed to run a high-volume of parts. These lines can run very long parts—as long as 26 feet.

This coating line uses automatic disks to spray the coating. There is usually a primer booth, a top coat booth and a clear coat booth if it is needed.

Once coated, the parts go into the baking oven for curing.
With that brief summary, we’ve had the opportunity to see how extruded products are manufactured and coated either with a high-performance coating or the anodized process.
Learning Objective Three

Provide overview of coating chemistry.

Next, let’s move into the chemistry of coatings.
Color in the Architectural Environment

- Color consistently a key selling feature for building components
- Color choices tend to be conservative
- Heightened consumer and design industry desire to express creativity through the power of architectural color
- Looking to color trends and bringing bolder color choices to projects

Since color can be a key selling feature on a building, high-performance coatings provide a wide range of color options.

Traditionally, the industry has used more conservative color choices like whites, beiges, bronzes, metallics and grays. The reason is that the formulation for these colors has historically been easier to make.

However, the science of coatings has come a long way. It’s exciting to see more color being used because coating manufacturers are now able to deliver the brighter, more eye-catching colors with the same long-term performance and durability in coatings that you get in more subtle colors.

Both consumers and the design industry are embracing the power of architectural color, and we are seeing more and more bolder color choices for projects.
What is a Coating?

Comprised of three principal ingredients:

15% 35% 50%

Pigments  Resin  Solvents

Additives: Control foam, flow, leveling
Viscosity Modifiers: Improve settling
Catalysts: Accelerate a chemical reaction

*Percentages vary by product type and color.

So what exactly is a coating?

The three main components of a coating are pigments, resins and solvents. The percentages will vary depending on the coating type, but here are some typical percentages you would see.

- **Pigments** supply both color and opacity, and they contribute to the performance of the coating itself.
- The **Resin System** is the glue that binds the coating together. It impacts the durability and the performance of the coating.
- **Solvents** enable us to properly control the application of the coating.
- **Additives, viscosity modifiers and catalysts** are added to help with wetting, dispersion, flow, leveling, settling and other special effects like texture.
Introduction to Pigments

- Blended to create desired color to suit aesthetics of application
- Types of pigments include:
  - Organic
  - Inorganic
  - Specialty – pearlescent and color-shifting
  - Solar Reflective (SR)
- Depending on application and desired color, sometimes each type of pigment is used in same formula
- Pigments can:
  - Provide opacity
  - Improve corrosion resistance

Let’s talk about pigments. Pigments are added to the paint to provide color. Types of pigments include organic, inorganic, specialty and solar reflective. Pigments are typically blended together in the same coating to achieve the desired color and performance qualities.

Pigments provide opacity. They help hide defects on the surface of the metal. UV opacity protects from harmful solar radiation, which can help ensure a longer life for the coating.

And, pigments can improve corrosion resistance.
**Organic Pigments**

- Colors from organic pigments can be very bright with vivid appearances
- Carbon-based
- Often made from petroleum compounds
- Less hiding power than inorganic pigments
- Poor weathering
- Low heat resistance

As we noted, there are both organic and inorganic pigments.

The colors from organic pigments have a very bright, vivid appearance. These are sometimes known as cleaner or purer colors. They are carbon-based and are often made from petroleum compounds. Because they’re more UV transparent, they have less hiding power and don’t weather as well. They are also less resistant to fade and heat.

That’s why organic pigments are combined with inorganic pigments when formulating a high-performance architectural coating to ensure that both the right color and durability can be achieved.
Inorganic Pigments

- Mineral-earth type pigments are very simple and naturally occurring colored substances
- Manufactured from mineral compounds that are mainly complex metal oxides
- Have superior:
  - Color stability
  - Weather resistance
  - Heat resistance
  - Chemical resistance

Inorganic pigments are manufactured from naturally-occurring mineral compounds. They are mainly complex metal oxides. They have superior color stability, heat and chemical resistance. Colors from inorganic pigments are less bright. They are typically beiges, browns, tans and other earth-tone colors.
Pearlescent Pigments

- Possess optical effects that serve decorative purposes, offering eye-catching luster
- Tiny flakes of reflective metal or refractive mica pigments added into paint mix
- Several other elements added into paint production process
- Unique effect achieved by light interference rather than light absorption

Pearlescent pigments provide a shiny metallic appearance to a coating. The tiny reflective metal or refractive mica pigments are added to the coating along with several other elements.

The optical effect of a pearlescent is achieved by light reflecting off the coating particles. Using a pearlescent coating can be a great way to differentiate an architectural project.
Color-Shifting Pigments

- Colors appear to change when viewed from different angles or sunlight
- Combinations of pearlescent mica or aluminum flakes are used
- Change in color and degree of color change controlled by composition and thickness of core and precipitated pigment

Color shifting pigments are a fairly new entry to the market and are added to coatings so that the color will shift when viewed from different angles or lighting. A combination of pearlescent mica and aluminum flakes are used.

Maybe you have seen an automobile with color-shifting paint on it. That’s the first industry that began using color-shifting pigments in a big way. As the car is coming toward you, it looks like one color. When it gets to you, it’s another color and as it moves away, it changes to yet a different color.

Color-shifting pigments can be used for a more subtle or dramatic effect depending on what you’re looking to achieve with your project.
We have now completed an overview of coating chemistry.
Learning Objective Four

Understand color options and finish hardness for each solution.

In this next learning objective, we'll talk a little more about color options and finish hardness for each solution.
High-Performance Coatings offer a clear advantage over Anodizing when it comes to color. The options are nearly limitless…from neutrals to high-intensity color. You can have a solid look or a more translucent finish if you want the metal to show through. You can achieve the anodized effect with coatings. Beyond the wide spectrum of color options, there are many specialty finishes including metallic, mica, pearlescent and color-shifting.

By comparison, Anodized Coatings offer limited color selections. Additionally, not all coaters offer every color option. Color categories typically include neutrals like clear, champagne, bronze, gold, silver and black. A few coaters are starting to offer blues, greens and reds.

Since the color created by anodizing is translucent to transparent, it does not provide complete hiding of the surface. Some specialty colors can be selected, but this can substantially increase the cost.
There are nearly unlimited choices of color and special effects with high-performance coatings compared to the limited choices in anodized finishes.

An important consideration is color matching batch-to-batch. With high-performance coatings, it’s easy to maintain color consistency from batch-to-batch with precise computerized color control. This is especially important on larger projects that can take multiple years to complete.

Another aspect of precise color-matching relates to the various building components. For example, the spray coatings used on the extruded components may need to match the coil coatings used on the metal siding. This can be achieved with high-performance coatings. With anodizing, it is harder to control color quality with more variability batch-to-batch. And it’s hard to match different components on a building.

Finally, let’s talk about hiding substrate defects. While high-performance coatings can hide defects in the metal substrate, an anodized finish is transparent and defects are visible. High-performance coatings are the clear choice when color-matching is critical for your projects.

### Color Coating Qualities

<table>
<thead>
<tr>
<th>Qualities</th>
<th>High-Performance Coating</th>
<th>Anodized Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color Options</td>
<td>Nearly Unlimited</td>
<td>Very Limited</td>
</tr>
<tr>
<td>Batch to Batch Color Consistency</td>
<td>Excellent</td>
<td>Can vary</td>
</tr>
<tr>
<td>Precise Color Matching</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Hiding Substrate Defects</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
Hardness Coating Qualities

<table>
<thead>
<tr>
<th>Qualities</th>
<th>High-Performance Coating</th>
<th>Anodized Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardness</td>
<td>Hard but can be marred and scratched</td>
<td>Very hard but can be scratched</td>
</tr>
<tr>
<td>Field Touchup</td>
<td>Yes</td>
<td>No, part must be replaced</td>
</tr>
</tbody>
</table>

Just a reminder, we’ve already talked a little about this. High-performance coatings are hard, but they can be marred. The great news is that they can be touched up in the field.

Anodizing creates a harder finish than coatings, but it can still be scratched. When this happens, you have to replace the entire anodized part. This can be expensive AND time-consuming.
With that, we’ve completed learning objective four. We’ve provided more information on color options and finish hardness for each solution.
In our last learning objective today, we’ll be talking about field performance, life cycle and warranty considerations when selecting a finish.

Learning Objective Five

Learn the difference between field performance of anodized versus paint coatings, and life cycle and warranty considerations.
Weatherability

<table>
<thead>
<tr>
<th>Performance Characteristics</th>
<th>High-Performance Coating</th>
<th>Anodized Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durable</td>
<td>Yes, if high-quality processes and products are used in production process</td>
<td>Yes, if high-quality processes and products are used in production process</td>
</tr>
<tr>
<td>Masonry Mortar Staining</td>
<td>Yes, more resistant than anodized</td>
<td>No, can be destroyed if masonry mortar is not removed immediately</td>
</tr>
<tr>
<td>Resistance to Corrosion and Acid Rain</td>
<td>Yes, more resistant than anodized</td>
<td>Yes</td>
</tr>
</tbody>
</table>

When we talk about field performance, we want to know how a finish is going to perform and how it will weather over time. Both high-performance coatings and anodized products are quite durable if a high-quality production process is used. They both have solid corrosion resistance and can withstand acid rain, although a high-performance coating tends to be more resistant than an anodized product, especially in a coastal environment where there is humidity and salt spray. This is a key consideration depending on the building type.

Another consideration: High-performance coatings are resistant to masonry mortar staining, where anodized surfaces can be destroyed if the mortar is not removed immediately.

And, of course, if there’s damage in the field, coatings can be restored quickly and easily, especially in high traffic areas. Replacement is the only remedy for damage to the anodized surface.
Next let’s talk about cost. From an initial pricing standpoint, finish quality can vary greatly whether a coating or anodized finish is selected and so can the price. It’s important to specify the project requirements on the front-end to ensure that you get the right coating for your application.

For high-performance coatings, the cost varies depending on the liquid or the powder finish desired. Powder can be the least expensive option due to a one-coat process…it can be less expensive than anodized.

Anodized aluminum costs less than a coating if a thinner layer is used, which is common.

Looking at life-cycle cost, high-performance coatings have a clear advantage over a lifetime of use. When field upkeep and repair is required, touchup is easy and fast. High-quality paints can be used so the aluminum has a factory-finish look and durability. Anodized aluminum cannot be touched up. It needs to be replaced, which is expensive.
Now, let’s take a look at the AAMA Specifications for coatings.

On the far left you will see the highest-performing category—AAMA 2605. The coatings in this category are high-performance 70% PVDF coatings and are typically used in high-rise, monumental and residential applications.

In the middle, is the AAMA 2604 specification. These are great-performing coatings with a little less longevity and durability. They are typically used for commercial and condominium projects.

On the right is AAMA 2603. These polyester coatings are used on commercial and residential projects for both interior and exterior surfaces. These are still excellent coatings, but they don’t deliver the same performance as an AAMA 2605 or 2604 coating.
Anodized finishes are classified into two levels of quality under the AAMA 611-14 specification.

The highest class, which is Class I, designates “high performance” finishes that are at least 0.7 mils thick. They are used on exterior building structures and in high-traffic areas.

Class II finishes are 0.4 and 0.7 mils thick. They are for use on exterior applications like storefronts and interior applications.
## Specs and Warranty: Exterior

<table>
<thead>
<tr>
<th>Specs and Warranty</th>
<th>70% PVDF Coating</th>
<th>50% PVDF Coating</th>
<th>Anodized Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-Performance Exterior Specification</td>
<td>AAMA 2605</td>
<td>AAMA 2604</td>
<td>AAMA 611-Class I</td>
</tr>
<tr>
<td>Color Retention</td>
<td>10 yrs: Fade = 5 Delta E</td>
<td>5 yrs: Fade = 5 Delta E</td>
<td>10 yrs: Fade = 5 Delta E</td>
</tr>
<tr>
<td>Chalk Resistance</td>
<td>10 yrs: Chalk = 8</td>
<td>5 yrs: Chalk = 8</td>
<td>No specification</td>
</tr>
<tr>
<td>Gloss Retention</td>
<td>10 yrs: 50% retention</td>
<td>5 yrs: 30% retention</td>
<td>15 unit variation</td>
</tr>
<tr>
<td>Warranty</td>
<td>25 to 30 years on gloss and color retention</td>
<td>5 to 10 years on gloss and color retention</td>
<td>5 years on chips, cracks, adhesion, chalk, color retention</td>
</tr>
</tbody>
</table>

Next, let’s look at specific performance characteristics of finish types based on AAMA specifications for high-performance and higher-end PVDF coatings and anodized finishes.

This kind of detail on performance is helpful when selecting the best finish for your project.

Take some time to read through and compare the various performance specifications of these coatings.
Next, let’s look at performance of AAMA 2603 coatings and the AAMA 611 Class II anodized finish. Remember, these coatings are used on light commercial, industrial and residential projects—either exterior or interior.

On color retention, the AAMA 2603 specification states that only a slight fade is acceptable after one year while the anodized AAMA 611 Class II specification for anodized states that after 10 years, the fade on the color may be no more than a 5 Delta E measurement.

For chalk resistance, a PVDF coating could have slight chalking after one year, while there is no specification for anodized finishes.

For gloss retention, there is no specification under AAMA 2603 for a polyester coating while an anodized finish can have a 15-unit variation.

For warranty, the AAMA 2603 specification requires 5 years on gloss and color retention, while there is no warranty specified for anodized finishes.
COMPLETED: Learning Objective Five

Learn the difference between field performance of anodized versus paint coatings, and life cycle and warranty considerations.

With that, we’ve completed the last learning objective…looking at field performance, cost and warranty considerations for the two finishes.
Make the Right Choice

Today, we’ve spent a lot of time talking about the many factors to consider when selecting a coating finish best suited for a building project. In summary, making the right choice involves these key factors:

- Aesthetics: What type of color and beauty is desired?
- Protection level: How long does the finish need to last? How much corrosion and mar resistance is required? Is the building in a hot, coastal climate? Many factors need to be considered.
- Field repair: Another important consideration is the ability to repair the finish in the field. Will repair be needed or not?
- Durability over time: Is this a monumental building designed to stand for decades or a retail store front that could change in a few years?

All of these factors are important when selecting the right coating finish.
CEU Credit Course Learning Objectives

1. Identify the advantages and limitations of anodized and paint coatings for aluminum extrusion building products.
2. Describe extrusion, anodized and coating manufacturing processes.
3. Provide overview of coating chemistry.
4. Understand color options and finish hardness for each solution.
5. Learn the difference between field performance of anodized versus paint coatings, and life cycle and warranty considerations.

In summary, today, we’ve:
- Identified the advantages and limitations of anodized and paint coatings for aluminum extrusion building products.
- Described the extrusion, anodized and coating manufacturing processes.
- Provided you with an overview of coating chemistry.
- Shared details on color options and finish hardness for each solution.
- Shown the difference between field performance of anodized versus paint coatings and life cycle and warranty considerations for both.
Thanks for joining us today! We hope you found this course valuable.

You can learn more about Valspar by visiting our website: valsparinspireme.com

Or, you can contact us at rommen@valspar.com
This program is registered with the AIA/CES for continuing professional education. As such, it does not include content that may be deemed or construed to constitute approval, sponsorship or endorsement by the AIA of any method, product, service, enterprise or organization.

The statements expressed by speakers, panelists, and other participants reflect their own views and do not necessarily reflect the views or positions of The American Institute of Architects, or of AIA components, or those of their respective officers, directors, members, employees, or other organizations, groups or individuals associated with them.

Questions related to specific products and services may be addressed at the conclusion of this presentation.